

**The Knowledge Bank at The Ohio State University**  
**Ohio State Engineer**

**Title:** Back Matter

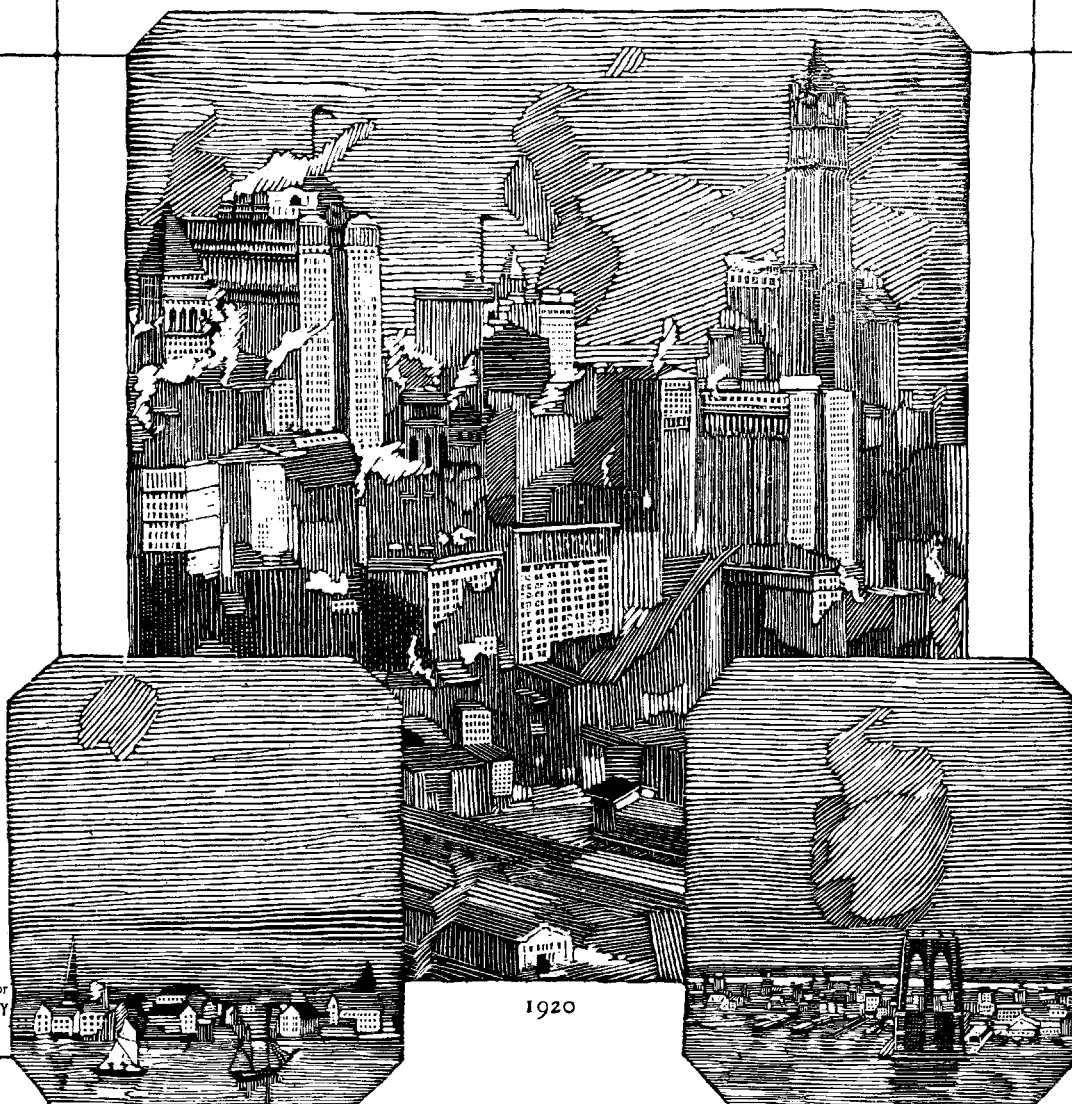
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The WORLD'S WORD for  
ELEVATOR SAFETY



The WORLD'S WORD for  
ELEVATOR SAFETY

1790

NEW YORK

1870

*Most of the famous buildings of the world  
are equipped with Otis Elevators*

**THE WOOLWORTH TOWER**—the tallest office building; the Equitable—the largest; the Singer Building—in fact most of the buildings that make up the best known sky line in the world, are equipped with Otis Elevators.

Few people realize the amount of wealth of Manhattan Island that is due to the creation and development of modern vertical transportation by the Otis Elevator Company. New York City could not grow wider hemmed in as it was by the two rivers and the bay. It *had* to grow skyward.

And now, the Otis Elevators in New York City carry daily more than twice the number of passengers carried by all the traction lines of New York—subway, surface, elevated and railroads.

Nothing short of a book would adequately tell the story of Otis in New York alone.

**OTIS ELEVATOR COMPANY**

Offices in all Principal Cities of the World

# A Brother to Atlas



The Ancients hailed Atlas, the giant who upheld their world, as the greatest embodiment of power. But Atlas was a myth.

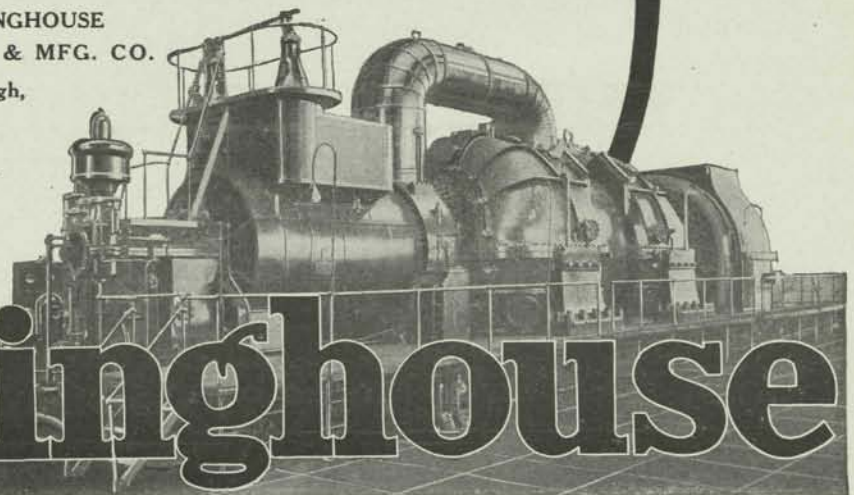
Science has produced a fit companion for Atlas, not a myth but a gigantic machine of iron, steel and copper, with such tremendous power that it is fitting to call it "A Brother To Atlas."

Atlas performed his duty by upholding the world, and the Westinghouse engineers are performing theirs in keeping the wheels of industry revolving. They are continually striving to create electrical apparatus that will conserve the energy of man and make our world a more desirable place in which to live.

Are you planning for your part in the future of the "World Electrical"?

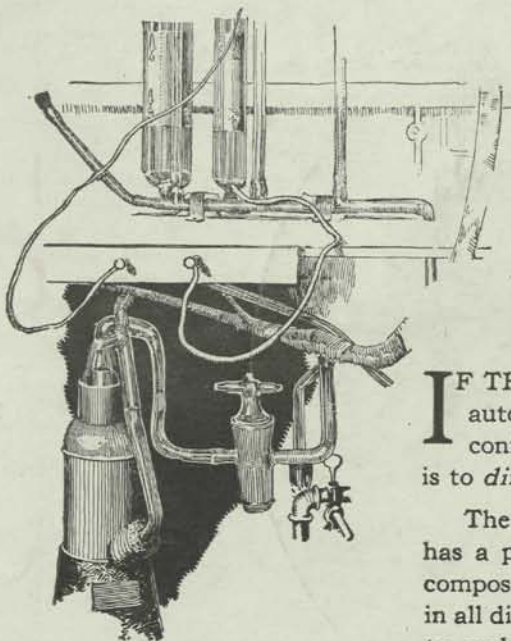
WESTINGHOUSE  
ELECTRIC & MFG. CO.  
East Pittsburgh,  
Pa.

Lester, Pa.



# Westinghouse





## What Is Vacuum?

**I**F THE traffic policeman did not hold up his hand and control the automobiles and wagons and people there would be collisions, confusion, and but little progress in any direction. His business is to *direct*.

The physicist who tries to obtain a vacuum that is nearly perfect has a problem somewhat like that of the traffic policeman. Air is composed of molecules — billions and billions of them flying about in all directions and often colliding. The physicist's pump is designed to make the molecules travel in one direction — out through the exhaust. The molecules are much too small to be seen even with a microscope, but the pump jogs them along and at least starts them in the right direction.

A perfect vacuum would be one in which there is not a single free molecule.

For over forty years scientists have been trying to pump and jog and herd more molecules out of vessels. There are still in the best vacuum obtainable more molecules per cubic centimeter than there are people in the world, in other words, about two billion. Whenever a new jogging device is invented, it becomes possible to eject a few million more molecules.

The Research Laboratories of the General Electric Company have spent years in trying to drive more and more molecules of air from containers. The chief purpose has been to study the effects obtained, as, for example, the boiling away of metals in a vacuum.

This investigation of high vacua had unexpected results. It became possible to make better X-ray tubes — better because the X-rays could be controlled; to make the electron tubes now so essential in long-range wireless communication more efficient and trustworthy; and to develop an entirely new type of incandescent lamp, one which is filled with a gas and which gives more light than any of the older lamps.

No one can foretell what will be the outcome of research in pure science. New knowledge, new ideas inevitably are gained. And sooner or later this new knowledge, these new ideas find a practical application. For this reason the primary purpose of the Research Laboratories of the General Electric Company is the broadening of human knowledge.

**General Electric**  
General Office **Company** Schenectady, N. Y.